PORTABLE COMPUTER SLEEP MODE SYSTEM SENSORS

FIELD

[0001] The described embodiments relate generally to electronic devices. More particularly, the described embodiments relate to sleep mode systems for electronic devices.

BACKGROUND

[0002] Sleep mode systems allow electronic devices to enter a state of low energy use, such as where battery conservation is preferable without deleting cache or ending running program states, for example. In the specific case of laptop computers and other clamshell type electronic devices, a resident sleep mode system can detect whether the computing device is closed and put the device into sleep mode automatically. While sleep mode systems for electronic devices have worked well in the past, there can be room for improvement.

SUMMARY

[0003] Representative embodiments set forth herein disclose various structures, methods, and features thereof for the disclosed portable computer sleep mode systems. In particular, the disclosed embodiments set forth electronic devices having a sleep mode that is more accurate and less foolproof than existing sleep mode systems.

[0004] According to various embodiments, a sleep mode system is configured for putting an electronic device into a sleep mode when a closed device configuration is detected. The sleep mode system can include: 1) a light source component; 2) a sensing component; and 3) a light altering component. The sensing component can detect light emitted from the light source component, with the light varying according to a variable rotation of the light altering component. A controller in communication with the sensing component can determine an orientation angle of the light altering component based upon the detected light.

[0005] In some embodiments, an electronic device can employ the sleep mode system to enter a sleep mode when the device is in a closed state and to wake from the sleep mode when the device is in an open state. The electronic device can be a laptop computer, where the light altering component can be arranged to rotate with the upper portion while the sensing component or light source remains stationary with the base portion. The orientation angle of the light altering component with respect to the stationary component can then match or correspond to the orientation angle of the upper portion with respect to the base portion of the laptop.

[0006] This Summary is provided merely for purposes of summarizing some example embodiments so as to provide a basic understanding of some aspects of the subject matter described herein. Accordingly, it will be appreciated that the above-described features are merely examples and should not be construed to narrow the scope or spirit of the subject matter described herein in any way. Other features, aspects, and advantages of the subject matter described will become apparent from the following Detailed Description, Figures, and Claims.

[0007] Other aspects and advantages of the embodiments described herein will become apparent from the following detailed description taken in conjunction with the accompanying drawings which illustrate, by way of example, the principles of the described embodiments.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The included drawings are for illustrative purposes and serve only to provide examples of possible structures and methods for the disclosed portable computer sleep mode systems. These drawings in no way limit any changes in form and detail that may be made to the embodiments by one skilled in the art without departing from the spirit and scope of the embodiments. The embodiments will be readily understood by the following detailed description in conjunction with the accompanying drawings, wherein like reference numerals designate like structural elements.

[0009] FIG. **1**A illustrates in front perspective view an exemplary electronic device in an open state according to various embodiments of the present disclosure.

[0010] FIG. **1**B illustrates in front perspective view the exemplary electronic device of FIG. **1**A in a closed state according to various embodiments of the present disclosure.

[0011] FIG. **2** illustrates in side perspective and partial cross-section view an exemplary sleep mode system region within the electronic device of FIG. **1**B in a closed state along section A-A of FIG. **1**B according to various embodiments of the present disclosure.

[0012] FIG. **3** illustrates in side perspective and partial cross-section view the exemplary sleep mode system region of FIG. **2** with its electronic device in an open state according to various embodiments of the present disclosure.

[0013] FIG. **4** illustrates in exploded side perspective view an exemplary hinge section for an electronic device having an optical arrangement for a sleep mode system according to various embodiments of the present disclosure.

[0014] FIG. **5** illustrates in exploded side perspective view an exemplary optical arrangement for a sleep mode system according to various embodiments of the present disclosure.

[0015] FIG. **6**A illustrates in front plan view an exemplary encoder disk for the optical arrangement of FIG. **5** according to various embodiments of the present disclosure.

[0016] FIG. **6**B illustrates a table of orientation angles and binary codes for the exemplary encoder disk of FIG. **6**A according to various embodiments of the present disclosure.

[0017] FIG. **7** illustrates in exploded side perspective view an exemplary alternative optical arrangement for a sleep mode system according to various embodiments of the present disclosure.

[0018] FIG. **8**A illustrates in front plan view an exemplary multiple polarizer disk and photocell arrangement for the optical arrangement of FIG. **7** according to various embodiments of the present disclosure.

[0019] FIG. **8**B illustrates a graph of orientation angles and optical intensities for the exemplary polarizer disk and photocells of FIG. **8**A according to various embodiments of the present disclosure.

[0020] FIG. **9** illustrates a flowchart of an exemplary method for operating a sleep mode system within an electronic device according to various embodiments of the present disclosure.

[0021] FIG. **10** illustrates in block diagram format an exemplary computing device that can be used to implement the various components and techniques described herein according to various embodiments of the present disclosure.